

REMARKS

Claims 101-103 are canceled without prejudice or disclaimer. Therefore, claims 97-100 and 104-149 are pending in the present application and at issue.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

I. The Rejection of Claims 97-98, 101-118, 123-127, 134-135 and 138-149 under 35 U.S.C. 103

Claims 97-98, 101-118, 123-127, 134-135 and 138-149 are rejected under 35 U.S.C. 103 as being unpatentable over Lutzen (U.S. Patent No. 4,316,956) in view of Yoshizumi et al. (U.S. Patent No. 4,092,434). This rejection is respectfully traversed for the reasons of record.

As stated in the prior response, Lutzen discloses a process for the production of ethanol comprising fermentation of an aqueous slurry of granular starch with an ethanol producing microorganism in the presence of alpha-amylase and glucoamylase.

Lutzen further discloses that the process optionally includes a pretreatment step in which the starch slurry is treated with an alpha-amylase and a glucoamylase at temperatures below the initial gelatinization temperature of granular starch. At column 3, lines 6-9, Lutzen states that the pretreatment generates a small proportion of fermentables in the slurry so that the microorganism has nutrient immediately available for initiating fermentation. Furthermore, at column 10, lines 2-5, Lutzen states that "Pretreatment of the starch slurry with either or both enzymes for up to 20 hours at from 30°C to 60°C will serve to hasten the commencement of fermentative generation of ethanol in the fermentor. All of the working examples which include a pretreatment step have a holding time of at least 3 hours. For example, Example 2 discloses a pretreatment step of 18 hours; Example 6 discloses a pretreatment step between 3-20 hours; and Example 8 discloses a pretreatment step of 4.5 hours.

However, Lutzen does not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

Yoshizumi et al. disclose a process for producing an alcohol comprising cooking a mash of cereal grains and liquefying enzymes at a temperature of from 75-85°C, saccharification, and fermentation with yeast. Because the process described in Yoshizumi et al. includes a liquefaction step at a temperature above the initial gelatinization temperature of the starch, the starch is partially gelatinized prior to saccharification and fermentation.

However, Yoshizumi et al. do not disclose a process for fermenting granular starch in the presence of an acid alpha-amylase, a glucoamylase and a yeast, as claimed herein. Moreover, Yoshizumi et al. also do not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

II. The Rejection of Claims 97-100, 116-122, 128-130, 132-133, and 137-149 under 35 U.S.C. 103

Claims 97-100, 116-122, 128-130, 132-133, and 137-149 are rejected under 35 U.S.C. 103 as being unpatentable over Lutzen (U.S. Patent No. 4,316,956) in view of Lantero et al. (U.S. Patent No. 5,231,017). This rejection is respectfully traversed for the reasons of record.

As discussed above, Lutzen does not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

Lantero et al. disclose a process for producing ethanol comprising liquefaction, saccharification, and fermentation, wherein a protease is introduced during saccharification and/or fermentation. Because the process described in Lantero et al. includes a liquefaction step at a temperature above the initial gelatinization temperature of the starch, the starch is gelatinized prior to saccharification and fermentation.

However, Lantero et al. do not disclose a process for fermenting granular starch in the presence of an acid alpha-amylase, a glucoamylase and a yeast, as claimed herein. Moreover, Lantero et al. also do not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

III. The Rejection of Claims 97-98 and 132 under 35 U.S.C. 103

Claims 97, 98 and 132 are rejected under 35 U.S.C. 103 as being unpatentable over Lutzen (U.S. Patent No. 4,316,956) in view of Katkocin et al. (U.S. Patent No. 4,536,477). This rejection is respectfully traversed for the reasons of record.

As discussed above, Lutzen does not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

Katkocin et al. disclose a *Clostridium* glucoamylase for use in hydrolysis of starch.

However, Katkocin et al. do not disclose a process for fermenting granular starch in the presence of an acid alpha-amylase, a glucoamylase and a yeast, as claimed herein. Moreover, Katkocin et al. also do not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

IV. The Rejection of Claims 97-98, 122, and 130-131 under 35 U.S.C. 103

Claims 97-98, 122, and 130-131 are rejected under 35 U.S.C. 103 as being unpatentable over Lutzen (U.S. Patent No. 4,316,956) in view of Veit et al. (U.S. Patent Application Publication No. 2004/0091983). This rejection is respectfully traversed for the reasons of record.

As discussed above, Lutzen does not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

Veit et al. disclose an alpha amylase having an amino acid sequence of SEQ ID NO: 1.

However, Veit et al. do not disclose a process for fermenting granular starch in the presence of an acid alpha-amylase, a glucoamylase and a yeast, as claimed herein. Moreover, Veit et al. also do not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

V. The Rejection of Claims 97-98 and 136 under 35 U.S.C. 103

Claims 97, 98 and 136 are rejected under 35 U.S.C. 103 as being unpatentable over Lutzen (U.S. Patent No. 4,316,956) in view of James et al. (U.S. Patent No. 3,880,742). This rejection is respectfully traversed for the reasons of record.

As discussed above, Lutzen does not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

James et al. disclose a thermostable beta-glucanase and its use in the degradation of glucan substrates such as barley-containing animal feed components and barley mashes.

However, James et al. do not disclose a process for fermenting granular starch in the presence of an acid alpha-amylase, a glucoamylase and a yeast, as claimed herein. Moreover, James et al. also do not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

VI. The Rejection of Claims 97-98 and 134-135 under 35 U.S.C. 103

Claims 97-98 and 134-135 are rejected under 35 U.S.C. 103 as being unpatentable over Lutzen (U.S. Patent No. 4,316,956) in view of Leach et al. (U.S. Patent No. 3,922,196) and in view of Gray et al. (Journal of Bacteriology, 1986, 166(2): 635-643). This rejection is respectfully traversed for the reasons of record.

As discussed above, Lutzen does not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

Leach et al. disclose for converting granular starch to a soluble starch hydrolysate comprising subjecting a slurry of granular starch to an alpha-amylase and a saccharifying enzyme at a temperature in the range of the initial gelatinization temperature and the actual gelatinization temperature.

Gray et al. disclose alpha-amylases obtained from *Bacillus licheniformis* and *Bacillus stearothermophilus*.

However, Leach et al. and Gray et al. do not disclose a process for fermenting granular starch in the presence of an acid alpha-amylase, a glucoamylase and a yeast at a temperature between 10°C and 35°C, as claimed herein. Moreover, Leach et al. and Gray et al. also do not teach or suggest a pretreatment step for a period between 20 minutes and 1½ hours, as claimed herein.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

VII. The Rejection of Claims 101-103 under 35 U.S.C. 112

Claims 101-103 are rejected under 35 U.S.C. 112 as being indefinite. Claims 101-103 have been canceled without prejudice or disclaimer. Therefore, this rejection is rendered moot.

VIII. The Rejection of Claims 97-100, 113-116, 119-122, 128-130 and 132-137 under 35 U.S.C. 102

Claims 97-100, 113-116, 119-122, 128-130 and 132-137 are rejected under 35 U.S.C. 102(e) as being anticipated by Grichko (U.S. Application Publication No. 2004/0063184). This rejection is respectfully traversed.

Grichko was filed on June 10, 2003 and claims the benefit of U.S. provisional application no. 60/413,730 filed September 26, 2002. However, paragraph 81 of Grichko, which was relied upon by the Office in this rejection, was not included in the provisional application but was added in the June 2003 application, which is after Applicants' effective filing date. Thus, Grichko is not prior art under 35 U.S.C. 102(e).

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 102. Applicants respectfully request reconsideration and withdrawal of the rejection.

IX. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

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